

California Regional Water Quality Control Board  
Santa Ana Region

November 17, 2000

ITEM: 14

SUBJECT: Status of Implementation of the Total Maximum Daily Load for  
Nutrients in the Newport Bay/San Diego Creek Watershed

## 1. BACKGROUND

In 1998, the Regional Board adopted an amendment to the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) to establish a Total Maximum Daily Load (TMDL) for nutrients in the Newport Bay/San Diego Creek Watershed (Resolution No. 98-9, as amended by Resolution No. 98-100). A copy of the TMDL is attached to this report.

Nutrient loading to the Bay, particularly from the San Diego Creek watershed, has resulted in seasonal algae blooms in the Bay that impair the Bay's beneficial uses. The TMDL was adopted to address this situation. It establishes targets for reduced nutrient loads, allocates the allowable loads among identified nutrient sources, and specifies schedules whereby the targets are to be achieved. The TMDL includes an implementation plan that specifies measures that will be taken to forward and assess compliance with the TMDL. The following is a brief report describing some of these elements of the TMDL and their current status.

### Section 2.a. Quantifiable Nutrient Targets

The TMDL specifies the overall goal that both total nitrogen and phosphorus loads are to be reduced by 50% by 2012. The target loads are shown in Table 5-9a of the TMDL.

Several features of this table warrant description. First, with respect to nitrogen, the TMDL differentiates between summer and winter loads. During consideration of the TMDL there was considerable debate about the need to control nitrogen inputs during the winter, since this is not generally the period of excessive algae growth. Winter load reductions were incorporated in the TMDL as part of the requisite margin of safety. However, recognizing the uncertainty, and the likely difficulty in reducing nutrient inputs during wet weather, the TMDL specifies a longer compliance schedule to achieve the winter load targets (by 2012) than those for the summer.

The phosphorus targets are based on annual loads. Again, there was considerable debate about the significance of phosphorus in causing excessive algae growth, and reductions in the phosphorus loads on an annual basis were incorporated in the TMDL as part of the margin of safety. The primary reduction of phosphorus loading is expected to

be achieved by the implementation of the Sediment TMDL for the Newport Bay/San Diego Creek watershed, since much phosphorus loading to the Bay occurs via soil particle transport to the Bay. As shown in Table 5-9a, two load targets are specified for nitrogen (summer) and phosphorus. These reflect 30% (interim) and 50% (final) load reductions, respectively.

Modeling conducted as part of the development of the TMDL showed that these nitrogen load reductions would be sufficient to ensure compliance with the Total Inorganic Nitrogen (TIN) objective (13 mg/l) for the lower reach of San Diego Creek (Reach 1, below Jeffrey Road). However, more stringent nitrogen load reductions were found necessary to meet the Reach 2 objective (5 mg/l). The acceptable load is shown in Table 5-9a.

Tables 5-9b, 5-9c, and 5-9d show the allocations of the allowable nutrient loads specified in Table 5-9a to the identified sources. Wasteload allocations (WLAs) are assigned to point source inputs of nutrients, including nursery discharges, which are (or will be) regulated under WDRs, and urban runoff. Load allocations are assigned to nonpoint nutrient sources, including agricultural runoff and "undefined" sources such as rising groundwater, atmospheric deposition, and inputs from open space lands.

#### Section 2b. and 2c. Phase I and II of the Nutrient TMDL

These sections constitute the implementation plan for the TMDL. Two phases of actions are established to ensure compliance with the target load schedules. Phase I of the plan lays out a series of actions to reduce nutrient loads. These include the revision of existing Waste Discharge Requirements (WDRs) and issuance of new WDRs to implement the Wasteload Allocations, developing an agricultural nutrient management plan, and evaluation of the urban stormwater program to assess its effectiveness in achieving the Wasteload Allocations. As part of Phase I, the Regional Board is to review, and revise as necessary, the TIN objectives for San Diego Creek, and to consider the appropriateness of establishing phosphorus objectives.

Phase II of the implementation plan includes the development of a Regional Monitoring Program (RMP) to assess the attainment of the goals of the Nutrient TMDL. It also calls for investigations into the currently unknown sources of nutrients in the Newport Bay watershed, including rising groundwater. The Regional Board will review the TMDL, WDRs and compliance schedule at least once every 3 years, starting in 2000.

Table 5-9e summarizes the schedules for implementation actions and compliance with the nutrient targets.

## **2. CURRENT STATUS AND ISSUES**

### Preliminary Nutrient Target Load Evaluation

On June 30, 2000, the Orange County Public Facilities and Resources Department (OCPF&RD), on behalf of the Newport Bay Watershed Executive Committee, submitted a report evaluating the current nutrient load to Upper Newport Bay in comparison to the target loads listed in the TMDL. The 1998 -1999 monitoring data at San Diego Creek at Campus Drive (representing inputs to Upper Newport Bay) indicate that:

- a. The summer nitrogen load complies with the 2002 summer target load for nitrogen.
- b. The winter nitrogen load is slightly above the 2012 winter target load for nitrogen (no winter target load is specified in the TMDL for 2002 and 2007).
- c. The total nitrogen annual load is slightly above the 2012 total target load for nitrogen.
- d. The total phosphorus annual load complies with the 2002 and 2007 target loads for phosphorus (no seasonal target load for phosphorus is specified in the TMDL).

These results indicate substantial progress toward compliance with the TMDL. Some of this progress can be attributed to the implementation and effectiveness of BMPs in the watershed. There have also been significant nitrogen load reductions resulting from the diversion by the Irvine Ranch Water District (IRWD) of a portion of San Diego Creek flows through wetlands ponds adjacent to IRWD's Michelson wastewater treatment plant.

The OCPF&RD report also assessed nutrient quality trends. The results show a general decreasing trend for nitrogen and phosphorus loads, with the exception of episodic storm events such as those in 1992-1993 and 1997-1998.

### Revision/Issuance of Waste Discharge Requirements

The existing Waste Discharge Requirements for three major nurseries are being revised and new WDRs for other nurseries are being developed. This process has been complicated by the promulgation of the California Toxics Rule and the need to develop appropriate effluent limits for toxic constituents. To assist in developing these permits, and to determine whether there would be any compliance problems, Board staff required the nurseries to conduct chemical and toxicity monitoring. The results to date indicate that there are likely to be compliance problems related to toxic substance (and TDS) discharges that will have to be addressed. The new/revised draft permits will include effluent limits that implement the wasteload allocations specified in the TMDL. The permits will likely be brought to the Board for consideration in early 2001.

The areawide urban stormwater permit for Orange County and its co-permittees is also under review and a revised permit is expected to be brought to the Board in March 2001.

Again, this revised permit will include requirements that implement the wasteload allocations specified in the TMDL.

#### Agricultural Nutrient Management Program (ANMP)

In October 1999, the Regional Board approved the Agricultural Nutrient Management Program that was prepared by the University of California Cooperative Extension (UCCE) on behalf of the Orange County Farm Bureau (Resolution No. 99-64). John Kabashima, Environmental Horticulture Advisor with the UCCE, briefly reviewed this program at the October 6, 2000 Board meeting. The ANMP consists of Best Management Practices (BMPs) to improve agricultural operations and reduce nutrient loads from agricultural runoff. The BMPs address nutrient and soil assessment, application of fertilizers to agricultural lands, timing of fertilizer applications, soil-water interactions, and quantity of water applied. Monitoring of nutrient concentrations in agricultural runoff is being and will be conducted to evaluate the effectiveness of the program. In addition, UCCE staff are working with farmers and nurseries on BMP implementation through an education and outreach program that includes public workshops and meetings.

#### Regional Nutrient Monitoring Program/Preliminary Nutrient Target Load Evaluation

In October 1999, the Regional Board approved the Regional Nutrient Monitoring Program (Resolution No. 99-77). This program is being conducted by the Newport Bay Watershed Executive Committee members.

#### Review and Revision of Water Quality Objectives for San Diego Creek

As noted, the Nutrient TMDL commits the Regional Board to the review and, if appropriate, revision of the TIN objectives for San Diego Creek. This commitment was included on the basis that these water quality objectives were established based on very limited historical data, and in response to the concern that the objectives may not be appropriate to protect Newport Bay. These objectives are being violated in both reaches of the Creek, and algae blooms and depressed dissolved oxygen levels have been observed. The Nutrient TMDL also calls for an examination of the appropriateness of establishing numerical water quality objectives for phosphorus for both reaches of the Creek (section 2.b).

The Regional Board has contracted with the Southern California Coastal Water Research Project (SCCWRP) to conduct the objectives study. Phase I of the study is to review nutrient data for the Creek and in the literature to evaluate their impacts on beneficial uses. Data gaps will be identified and sampling/study plans will be recommended to address deficiencies. This phase of the study was initiated on July 1, 2000 and will end December 31, 2000. Phase II of the study is expected to be initiated in January 2001. The plan is to conduct the monitoring/studies necessary to fill data gaps and to arrive at

recommendations regarding the objectives. We hope to complete this work by the end of 2001.

A steering committee has been formed to provide guidance to the Regional Board and SCCWRP. The committee includes: Dr. Peggy Fong (UCLA), Dr. Alex Horne (UCB), Dr. Peter Bowler (UCI), Eric Burres (CDF&G), Suesan Saucerman (US EPA), Linda Rao (SWRCB), Greig Peters (RWQCB9), Jack Skinner (SPON), John Kabashima (UCCE), Ken Thompson (IRWD), and Chris Crompton (OC PF&RD). SCCWRP has summarized the information reviewed and performed statistical analyses on the data. The results are provided in a progress report, which has been transmitted to the steering committee members for review. A meeting has been scheduled on November 8 to solicit input from the committee.